Attachment A to Resolution No. 04-XXX

Amendment to the Water Quality Control Plan – Los Angeles Region to incorporate the Ballona Creek and Ballona Creek Estuary Metals TMDL

Adopted by the California Regional Water Quality Control Board, Los Angeles Region on September 2, 2004.

Amendments:

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Add:

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Chapter 7. Total Maximum Daily Loads (TMDLs) Summaries, Section 7-12 (Ballona Creek and Ballona Creek Estuary Metals TMDL)

This TMDL was adopted by the Regional Water Quality Control Board on [Insert Date].

This TMDL was approved by:

The State Water Resources Control Board on [Insert Date].
The Office of Administrative Law on [Insert Date].
The U.S. Environmental Protection Agency on [Insert Date].

The following tables include the elements of this TMDL.

Table 7-12.1. Ballona Creek and Ballona Creek Estuary Metals TMDL: Elements

Element	Key Findings and Regulatory Provisions
Problem Statement	Elevated concentrations of copper, lead, selenium, and zinc in Ballona Creek and Sepulveda Canyon Channel and elevated concentrations of cadmium, lead, silver and zinc in sediments in Ballona Creek Estuary (Estuary) are causing impairments of beneficial uses. The following designated beneficial uses are impacted by these metals: water contact recreation (REC1); non-contact water recreation (REC2); warm freshwater habitat (WARM); estuarine habitat (EST); marine habitat (MAR); wildlife habitat (WILD); rare and threatened or endangered species (RARE); migration of aquatic organisms (MIGR); reproduction and early development of fish (SPWN); commercial and sport fishing (COMM); and shellfish harvesting (SHELL).
Numeric Target *(Interpretation of the narrative and numeric water quality objective, used to calculate the waste load allocations)*	Numeric targets are listed in Table 7-12.2. Numeric targets for the TMDL were calculated based on the water quality standards promulgated for metals by USEPA in the California Toxics Rule (CTR) of 2000. The CTR establishes short-term (acute) and long-term (chronic) aquatic life criteria for metals in both freshwater and saltwater. The acute criteria are defined as the highest concentrations of pollutants to which aquatic life can be exposed for a short period of time without deleterious effects. The chronic criteria are defined as the highest concentration of a pollutant to which aquatic life can be exposed for an extended period of time (4 days) without deleterious effects. The freshwater aquatic life criteria apply to waters in which the salinity is equal to or less than 1 part per thousand (ppt) 95 percent or more of the time. The saltwater aquatic life criteria apply to waters in which salinity is equal to or greater than 10 ppt 95 percent or more of the time. For waters in which the salinity is between one and 10 ppt, the more stringent of the freshwater or saltwater aquatic life criteria apply. The freshwater aquatic life criteria for cadmium, copper, lead, silver and zinc are expressed as a function of hardness because hardness and/or water quality characteristics that are usually correlated with hardness can reduce or increase the toxicity of some metals. Hardness is used as a surrogate for a number of water quality characteristics, which affect the toxicity of metals in a variety of ways. Increasing hardness has the effect of decreasing the toxicity of metals. Water quality criteria to protect aquatic life may be calculated at different concentrations of hardness measured in milligrams per liter (mg/L) as calcium carbonate ($CaCO3$). Separate numeric targets adjusted for hardness were developed for dry and wet weather because the conditions in Ballona Creek, Sepulveda Canyon Channel and the Estuary vary dramatically between dry and wet weather. During dry weather, the more stringent of the acute or chronic criteria were selected based on a median hardness value of 300 mg/L. During wet weather, the median hardness of 77 mg/L is assumed to be representative of wet-weather conditions. The short-

Element	Key Findings and Regulatory Provisions
	term (acute) criteria were determined to be appropriate for setting the number targets during wet weather. The numeric targets for dry weather and wet weather are expressed in terms of dissolved fraction of the metals in the water column, since, the dissolved forms are the most bioavailable to aquatic organisms. However, transformation between total and dissolved metals is expected to occur in stream. The partitioning between particulate and dissolved phases differs during dry and wet weather Conversion factors to convert total metals to dissolved during dry and wet weather are provided (see Table 7-12.3).
Source Analysis	The major contributor of flows and associated metals loading to Ballona Creek, Sepulveda Canyon Channel, and Ballona Creek Estuary is dry-weather urban runoff and wet-weather runoff discharged from the storm water conveyance system. This assumption was validated with modeling studies conducted by the Regional Board for dry weather and Southern California Coastal Water Research Project for wet weather. This TMDL focuses on developing mass-based and concentration-based waste load allocations for the Los Angeles County MS4 and Caltrans storm water permittees. For wet-weather conditions, the TMDL developed load capacity curves for the MS4 and Caltrans stormwater permittees. Concentration-based waste load allocations were developed for dry and wet weather for the minor NPDES discharges, general NPDES discharges, and general industrial and construction stormwater discharges. Non-point sources are not considered to be a significant source in this TMDL. Direct atmospheric deposition of metals is insignificant relative to the annual dry-weather loading or the total annual loading. Indirect atmospheric deposition reflects the process by which metals deposited on the land surface may be washed off during storm events and delivered to Ballona Creek and its tributaries. The loading of metals associated with indirect atmospheric deposition are accounted for in the estimates of the storm water loading.
Loading Capacity	Dry-weather loading capacities for Ballona Creek, Sepulveda Canyon Channel, and Centinela Channel were determined through assessment of in-stream water quality at critical points identified as Ballona Creek at Sawtelle Boulevard, and the mouths of Sepulveda Canyon Channel, and Centinela Channel. For Ballona Creek Estuary, the specific loading capacity of the waterbody could not be established without more intensive modeling analysis of transport and assimilation properties. Until such studies are performed, the sum of the loading capacity at the critical discharge points is assumed to be the loading capacity for Ballona Creek Estuary. The loading capacity for each reach was derived for each metal by multiplying the hardness-adjusted numeric target, as defined in the CTR, by the critical flow assigned to each reach. During wet weather, the loading capacity is a function of the volume of

Element	Key Findings and Regulatory Provisions
	water in the creek. Given the variability in wet-weather flows, the concept of a single critical flow is not applicable. Instead, a load-duration curve is developed. The calibrated watershed model was used to simulate storm volumes and associated metals loads over a 10-year period. Storm volumes, storm loads, and accumulated rainfall were aggregated over each storm's period. Loading capacities for each storm are then calculated by multiplying the storm volume by the appropriate numeric water quality target. The result is a curve which identifies the flow-weighted load capacity for a given rainfall event. Assessment of the wet-weather load capacity of Ballona Creek, Sepulveda Canyon Channel, Centinela Channel, and Ballona Creek Estuary was performed using critical discharge points consistent with those used for dry-weather TMDL development. Loading capacities for Ballona Creek (at Sawtelle Boulevard), Sepulveda Canyon Channel, and Centinela Channel were determined directly through calculation of capacities at their respective discharge points. To calculate the load capacity of Ballona Creek Estuary, we added the loading capacities of Ballona Creek, Sepulveda Canyon Channel, and Centinela Channel.
Waste Load Allocations *(for point sources)*	Waste load allocations (WLAs) were developed as a grouped allocation for the MS4 storm water permittees and Caltrans. USEPA requires that WLAs be developed for NPDES-regulated storm water dischargers. Allocations for NPDES-regulated storm water discharges from multiple point sources may be expressed as a single categorical waste load allocation when data and information are insufficient to assign each source or outfall individual allocations. WLAs are expressed as total metals to account for in-stream partitioning between particulate and dissolved phases. The reciprocal of the conversion factors in Table 7-12.3 were used to convert dissolved metals in Table 7-12.2 to total metals (see Table 7-12.4). The Los Angeles County MS4 and Caltrans storm water permittees are assigned concentration-based and mass-based WLAs during dry weather, and mass-based WLAs during wet weather. Concentration-based WLAs are presented in Table 7-12.4. Mass-based allocations are established at three critical discharge points. Mass-based WLAs are assigned to Ballona Creek (at Sawtelle Boulevard), Sepulveda Canyon Channel, and Centinela Channel, with a combined WLA for the discharge to Ballona Creek Estuary. Table 7-12.5 presents the mass-based WLAs for each critical discharge point during dry weather. The wet-weather WLAs for the MS4 permittees and Caltrans are defined as the load capacity curves presented in Figures 7-12.1 through 7-12.18. The load capacity curves are generated for cadmium, copper, lead, selenium, silver and zinc at each critical discharge point. Concentration-based WLAs apply to the minor and general NPDES discharges. This was done since there is insufficient flow information from these discharges to develop individual mass-based WLAs. Similarly, concentration-based WLAs are being placed on dry- and wet-weather flows associated with the general industrial storm water

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	permits and the general construction storm water permits. The WLAs during dry and wet weather for all minor NPDES, general NPDES, general industrial storm water and general construction storm water permits are listed in Table 7-12.4. Any future minor NPDES permits or enrollees under a general NPDES permit, general industrial storm water permit or general construction storm water permit will also be subject to the WLAs in Table 7-12.4.
Load Allocations *(for nonpoint sources)*	Load allocations for nonpoint sources were not developed for this TMDL. Two potential nonpoint sources are urban runoff from areas not covered by the MS4 or Caltrans Storm Water Permits and atmospheric deposition. Specific load allocation for natural background were not developed because most of the land area in the watershed is covered under the storm water permit with the exception of the area of National or State Parks. No allocations were given to these areas because dry- and wet-weather loads from these areas are unlikely to significantly contribute to the overall load. The background metals concentrations associated with these flows from these areas are expected to be low. Allocations for atmospheric deposition were not developed because the loading associated with direct deposition is insignificant relative to the total allowable load and the loading associated with indirect deposition is address through the storm water WLAs.
Margin of Safety	A margin of safety has been implicitly included through the use of conservative assumptions. The following conservative assumptions apply to the technical approaches used for the dry- and wet-weather analyses: 1. Conservative values were used for the conversion of dissolved metals numeric targets to total metals. 2. Analyses were performed at three critical discharge points determined to be locations associated with higher metals loading. Centinela Channel is currently not listed as impaired, although TMDL analysis was performed at this critical point to ensure that the loading capacity of Ballona Creek Estuary is addressed. 3. The wet-weather loadings predicted by the model tend to over estimate the actual loadings. Therefore, the estimated percent reduction necessary to meet the waste load allocation is conservative.
Implementation	The regulatory mechanisms used to implement the TMDL will include the Los Angeles County Municipal Storm Water NPDES Permit (MS4), the State of California Department of Transportation (Caltrans) Storm Water Permit, minor NPDES permits, general NPDES permits, general industrial storm water permits, general construction storm water permits, and the authority contained in Sections 13263 and 13267 of the Water Code. The administrative record and the fact sheets for the MS4 permittees and Caltrans must provide reasonable assurance that the BMPs selected

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	will be sufficient to implement the WLAs in the TMDL. We expect that reductions to be achieved by each BMP will be documented and that sufficient monitoring will be put in place to verify that the desired reductions are achieved. The permits should also provide a mechanism to make adjustments to the required BMPs as necessary to ensure their adequate performance. The County of Los Angeles, City of Los Angeles, Beverly Hills, Culver City, Inglewood, Santa Monica, West Hollywood, and Caltrans are jointly responsible for meeting the WLAs. The primary jurisdiction for the Ballona Creek watershed is the City of Los Angeles. Each municipality and permittee will be required to meet the WLAs at the designated compliance assessment points. The proposed implementation schedule shall consist of a phased approach. NPDES permits for point sources, other than the MS4 and Caltrans, shall incorporate the applicable concentration-based WLAs when the permit is issued or renewed. The MS4 co-permittees and Caltrans are subject to a phased implementation schedule with interim compliance to be achieved in prescribed percentages of the watershed, with total compliance to be achieved within 15 years, as summarized in Table 7-12.6. The Regional Board intends to reconsider this TMDL in six years after the effective date of the TMDL to re-evaluate the WLAs for Ballona Creek Estuary.
Seasonal Variations and Critical Conditions	Seasonal variations are addressed by developing separate WLAs for dry weather and wet weather because conditions in Ballona Creek, Sepulveda Canyon Channel and the Estuary vary dramatically between these conditions. Based on long-term flow records, dry-weather flows in Ballona Creek are estimated to be 14 cubic feet per second (cfs). Since, this flow has been very consistent, 14 cfs was used to define the critical dry-weather flow for Ballona Creek at Sawtelle Boulevard (upstream of Sepulveda Canyon Channel). There were no historic flow records to determine the average long-term flows for Sepulveda Canyon Channel and Centinela Channel. Therefore, in the absence of historical records the 2003 dry-weather characterization study measurements were assumed reasonable estimates of flow for these channels. The critical dry-weather flow for Sepulveda Canyon Channel is defined as the average flow of 6.3 cfs. The critical dry-weather flow for Centinela Channel is defined as the average flow of 5.0 cfs. Due to the variability of wet-weather flows, a model was used to simulate the flow and metals concentrations from January 1990 to December 1999. By including all storm loads over the 10-year period, analysis of critical conditions was provided.

Element	Key Findings and Regulatory Provisions
Monitoring	The monitoring program has three objectives. The first is to collect additional water quality data (e.g., hardness and background concentrations) to evaluate the assumptions made in development of the TMDL including the frequency and extent of exceedances. The second is to collect data to assess compliance with the WLAs. The third is to conduct special studies to address the uncertainties in the TMDL and to assist in the design and sizing of BMPs and stormwater retention facilities. **Ambient monitoring**. An ambient monitoring program is required to assess water quality throughout Ballona Creek and its tributaries. Data on background water quality will help to refine the numeric targets and assess selenium impairment. At a minimum, ambient monitoring shall be conducted at the locations listed in Table 7-12.7. The ambient monitoring program, at a minimum, shall analyze for hardness, and total and dissolved metals at detection limits that are lower than the CTR criteria to determine if water quality objectives are being met. **Compliance monitoring**. At a minimum, compliance will be assessed at the monitoring locations listed in Table 7-12.7 in accordance with the implementation schedule, Table 7-12.6, and will be conducted on a monthly basis. Individual samples may serve both ambient and compliance monitoring requirements. The MS4 co-permittees and Caltrans may elect to demonstrate compliance with concentration-based and/or mass-based WLAs during dry weather. However, reliable flow measurements must be provided if compliance with mass-based WLAs is selected. If compliance with concentration based WLAs is to be demonstrated, discrete grab samples shall be collected every hour during a 24-hour period at each monitoring location. Out of the 24 samples collect at each monitoring location at least four samples shall be randomly selected to be analyzed. All samples collected during the randomly selected time periods shall be analyzed for total metals, dissolved metals and hardness. Detection/reporting limits must be below the applicable concentration-based WLA. If the analysis indicates that the WLA has been exceeded, samples from prior and/or subsequent time periods shall be analyzed to determine the duration of the exceedance. In addition, an investigation shall be conducted in an attempt to identify the source of the exceedance. The MS4 and Caltrans stormwater NPDES permittees will be deemed in compliance with the WLAs during dry weather if the in-stream pollutant concentrations at the downstream ambient monitoring location is at or less than the corresponding WLA. Alternatively, compliance with interim compliance targets may be assessed at the storm drain outlet based on the concentration-based WLA for the receiving water. For storm drains that discharge to other storm drains, the WLA will be the same as the WLA for the ultimate receiving water for that storm drain system.

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	In order to determine compliance with the wet-weather WLAs, an in-stream flow meter is required at each of the compliance monitoring locations. Flow only needs to be measured during wet-weather compliance assessment monitoring, which does not commence until six years after the effective date of the TMDL. At a minimum, during wet weather, permittees must collect a flow-weighted composite sample for six storm events per storm year[1] or all storm events per year, which ever is less downstream from the drainage area where compliance is required. MS4 co-permittees and Caltrans must report total metal concentrations, dissolved metal concentrations, hardness, total storm volume, calculated load of total metals and the total inches of rain for the drainage area. A storm event is defined as a day that rainfall occurs plus all consecutive days that flow is above base flow; rainfall that occurs following a day of no rainfall, even if flow is still above base flow, is considered a separate storm event. The MS4 and Caltrans stormwater NPDES permittees will be deemed in compliance with the WLAs during wet weather if the pollutant load at the downstream monitoring location is at or less then the load capacity as determined from the corresponding load duration curve Figures 7-12.1 through 7-12.18. **Special studies.** The following special studies are recommended: • Refinement of hydrologic and water quality model for the estuary • Refinement of potency factors correlation between total suspended solids and metals loadings during dry and wet weather • Correlation between short-term rainfall intensity and metals loadings for use in sizing in-line structural BMPs • Correlation between storm volume and total metals loading for use in sizing stormwater retention facilities • Refined estimates of metals partitioning coefficients, metal translators, and site-specific toxicity.

Note: The complete staff report for the TMDL is available for review upon request.

[1] The storm year is defined as November 1st through October 31st.

Table 7-12.2. Numeric Targets Expressed in terms of the Dissolved Fraction, except for selenium as noted.

Metal	Dry–Weather Numeric Targets		Wet–Weather Numeric Targets	
	Freshwater* (µg/L)	Saltwater (µg/L)	Freshwater** (µg/L)	Saltwater (µg/L)
Cadmium	5.0	9.3	3.2	42
Copper	23	3.1	11	4.8
Lead	8.1	8.1	49	210
Selenium	5.0^	71	5.0^	290
Silver	23	1.9	2.2	1.9
Zinc	300	81	94	90

* Dry-weather freshwater numeric targets are based on a hardness of 300 mg/L as CaCO3.
** Wet-weather freshwater numeric targets are based on a hardness of 77 mg/L as CaCO3.
^ For selenium, the chronic criterion is expressed in the total recoverable form.

Table 7-12.3. Conversion Factors to Convert Total Metals to Dissolved Metal Concentrations.

Metal	Dry–Weather Conversion Factors		Wet–Weather Conversion Factors	
	Freshwater	Saltwater*	Freshwater	Saltwater*
Cadmium	0.863**	0.994	0.955**	0.994
Copper	0.96	0.83	0.62	0.83
Lead	0.631**	0.951	0.829**	0.951
Selenium	---	0.998	---	0.998
Silver	0.85	0.85	0.85	0.85
Zinc	0.986	0.946	0.79	0.946

* Conversion factors for saltwater acute criteria have been used for both acute and chronic saltwater criteria because conversion factors for saltwater chronic criteria are not currently available.
** Conversion factor is hardness dependent. Dry-weather conversion factors are based on a hardness of 300 mg/L as CaCO3. Wet-weather conversion factors are based on a hardness of 77 mg/L as CaCO3.

Table 7-12.4. Concentration-Based Waste Load Allocations Expressed in Terms of Total Metals

Metal	Dry–Weather Waste Load Allocations		Wet–Weather Waste Load Allocations	
	Freshwater* (µg/L)	Saltwater (µg/L)	Freshwater** (µg/L)	Saltwater (µg/L)
Cadmium	5.8	9.4	3.4	42
Copper	24	3.7	11	5.8
Lead	13	8.5	59	220
Selenium	5.0	71	5.0	290
Silver	27	2.2	2.6	2.2
Zinc	300	86	96	95

* Dry-weather waste load allocations are based on a hardness of 300 mg/L as CaCO3.
** Wet-weather waste load allocations are based on a hardness of 77 mg/L as CaCO3.

Table 7-12.5. Mass-Based Dry-weather waste load allocations for Ballona Creek, Sepulveda Canyon Channel, Centinela Channel, and Ballona Creek Estuary (grams/day of total metals)

Waterbody	Cadmium	Copper	Lead	Selenium	Silver	Zinc
Ballona Creek at Overland	198	821	440	171	927	10,423
Sepulveda Canyon Channel	90	371	199	77	419	4,712
Centinela Channel	71	294	157	61	332	3,728
Ballona Creek Estuary	359	1486	796	309	1,678	18,863

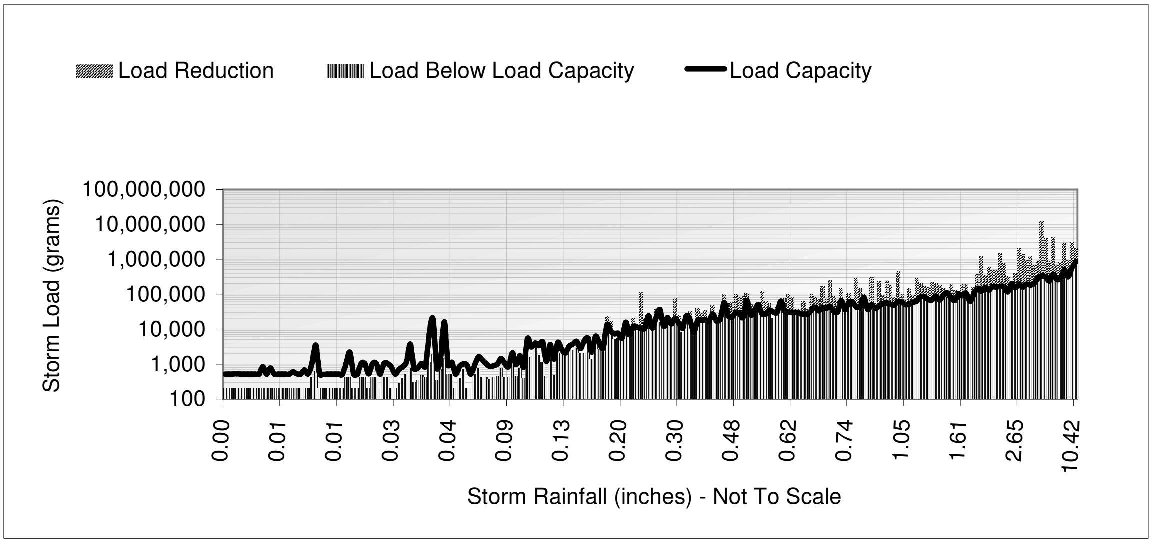
Table 7-12.6. Ballona Creek and Ballona Creek Estuary Metals TMDL: Significant Dates

Date	Action
Effective date of the TMDL	NPDES permits, other than the MS4 and Caltrans stormwater permits, to incorporate concentration-based WLAs (Table 7-12.4) at the time of permit issuance or re-issuance.
120 days after the effective date of the TMDL	Responsible jurisdictions and agencies must submit a coordinated monitoring plan, to be approved by the Executive Officer, which includes both compliance assessment monitoring and ambient monitoring. Once the coordinated monitoring plan is approved by the Executive Officer ambient monitoring shall commence.
12 months after effective date of TMDL (Draft Report) 16 months after effective date of TMDL (Final Report)	MS4 co-permittees and Caltrans shall provide a written report to the Regional Board outlining the drainage areas to be address and how these areas will achieve compliance with the WLAs. The report shall include implementation methods, an implementation schedule, proposed milestones, and any applicable revisions to the compliance assessment monitoring plan.
6 years after effective date of the TMDLs	The Regional Board shall reconsider this TMDL to re-evaluate the WLAs for Ballona Creek Estuary.
6 years after effective date of the TMDL	50% of the total drainage area shall achieve compliance with the dry-weather WLAs and 25% of the total drainage area will achieve compliance with the wet-weather WLAs.
8 years after effective date of the TMDL	75% of the total drainage area shall achieve compliance with the dry-weather WLAs.
10 years after effective date of the TMDL	100% of the total drainage area shall achieve compliance with the dry-weather WLAs and 50% of the total drainage area will achieve compliance with the wet-weather WLAs.
15 years after effective date of the TMDL	100% of the total drainage area shall achieve compliance with both the dry-weather and wet-weather WLAs.

Table 7-12.7. Ambient and Compliance Assessment Monitoring Locations

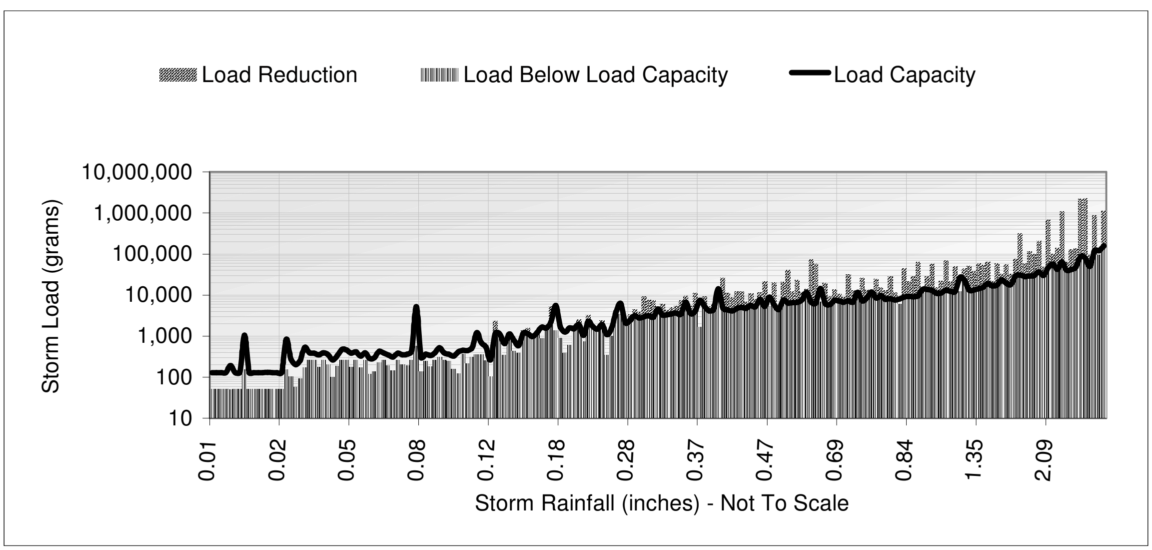
Waterbody	Monitoring Locations
Ballona Creek	Sawtelle Boulevard
Sepulveda Canyon Channel	Just Above the Confluence with Ballona Creek
Centinela Channel	Just Above the Confluence with Ballona Creek
Ballona Creek Estuary	Centinela Avenue

Figure 7-12.1. Load-Duration Curve for Copper – Ballona Creek at Sawtelle Boulevard



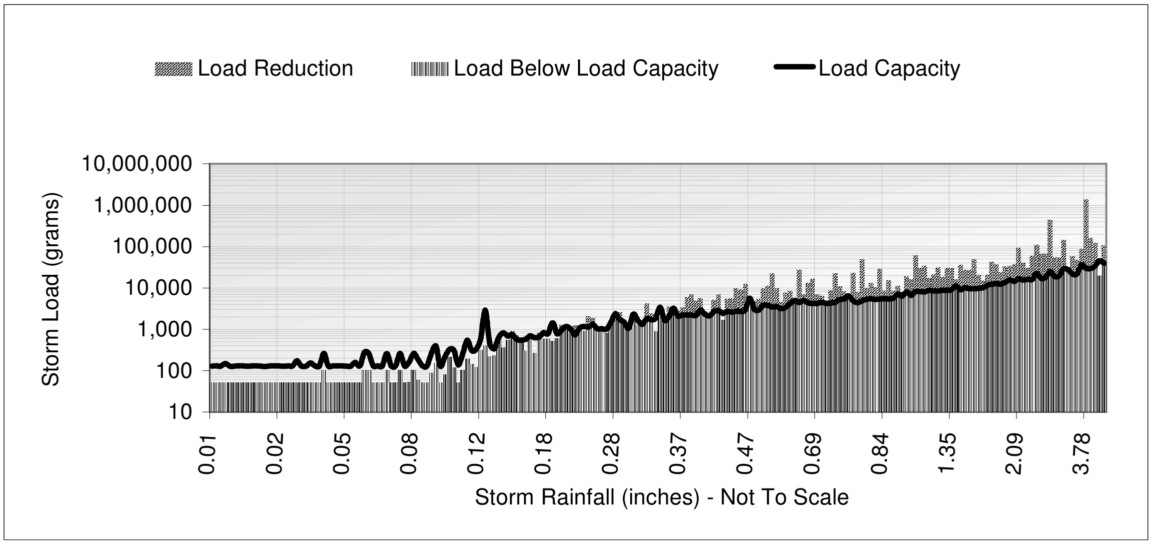
Computed Load Indicators:	Value	Units
Total Storms Over 10-Year Period:	226	none
Total Below Load Capacity Curve:	11,029	kg
Total Existing Load:	54,745	kg
Existing Load Below Load Capacity Curve:	10,815	kg
Existing Load Above Load Capacity Curve:	43,930	kg
TMDL Waste Load Reduction:	80.2%	none

Figure 7-12.2. Load-Duration Curve for Copper – Sepulveda Canyon Channel



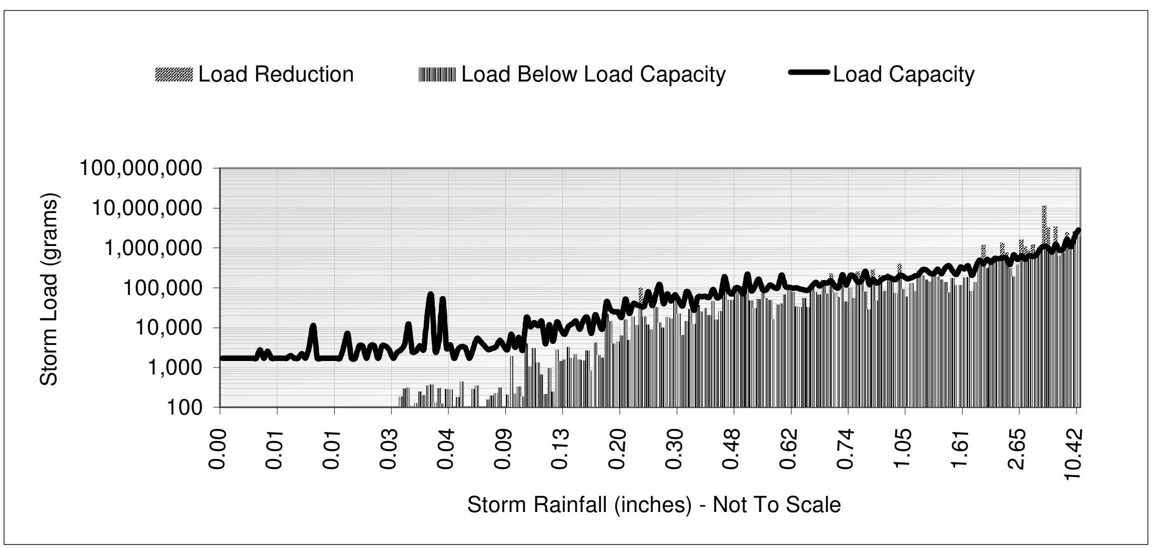
Computed Load Indicators:	Value	Units
Total Storms Over 10-Year Period:	193	none
Total Below Load Capacity Curve:	1,971	kg
Total Existing Load:	11,702	kg
Existing Load Below Load Capacity Curve:	1,875	kg
Existing Load Above Load Capacity Curve:	9,826	kg
TMDL Waste Load Reduction:	84.0%	none

Figure 7-12.3. Load-Duration Curve for <u>Copper</u> – Centinela Channel



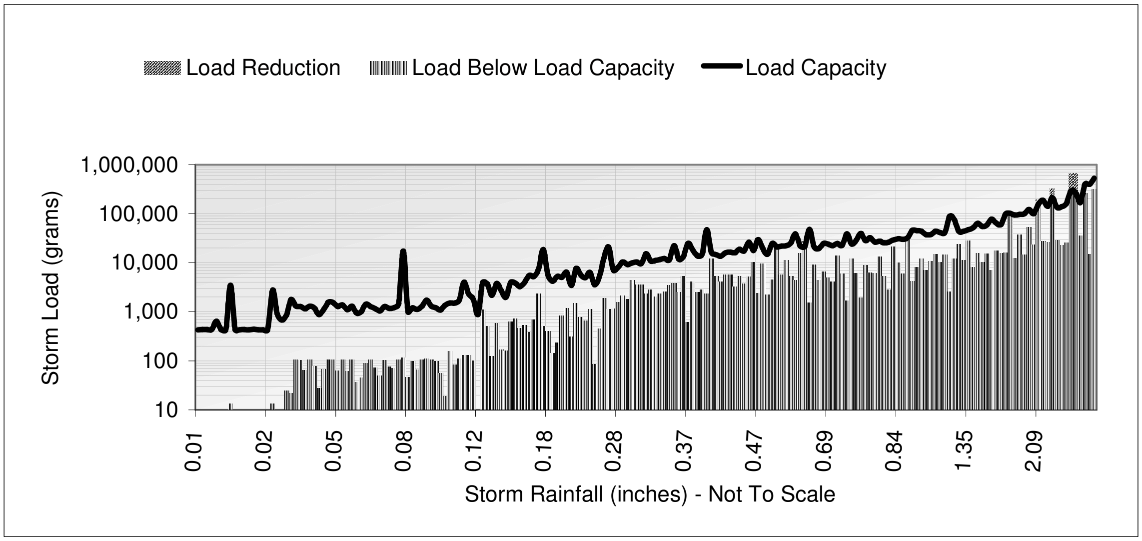
Computed Load Indicators:	Value	Units
Total Storms Over 10-Year Period:	200	none
Total Below Load Capacity Curve:	1,023	kg
Total Existing Load:	4,452	kg
Existing Load Below Load Capacity Curve:	978	kg
Existing Load Above Load Capacity Curve:	3,475	kg
TMDL Waste Load Reduction:	78.0%	none

Figure 7-12.4. Load-Duration Curve for Lead – Ballona Creek at Sawtelle Boulevard



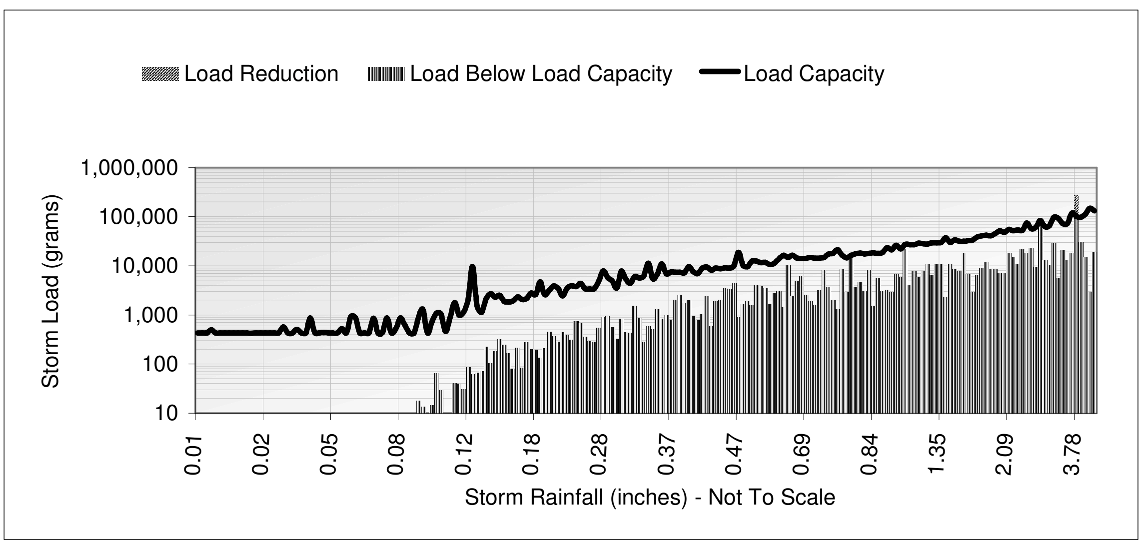
Computed Load Indicators:	Value	Units
Total Storms Over 10-Year Period:	226	none
Total Below Load Capacity Curve:	36,745	kg
Total Existing Load:	48,888	kg
Existing Load Below Load Capacity Curve:	27,562	kg
Existing Load Above Load Capacity Curve:	21,327	kg
TMDL Waste Load Reduction:	43.6%	none

Figure 7-12.5. Load-Duration Curve for Lead – Sepulveda Canyon Channel



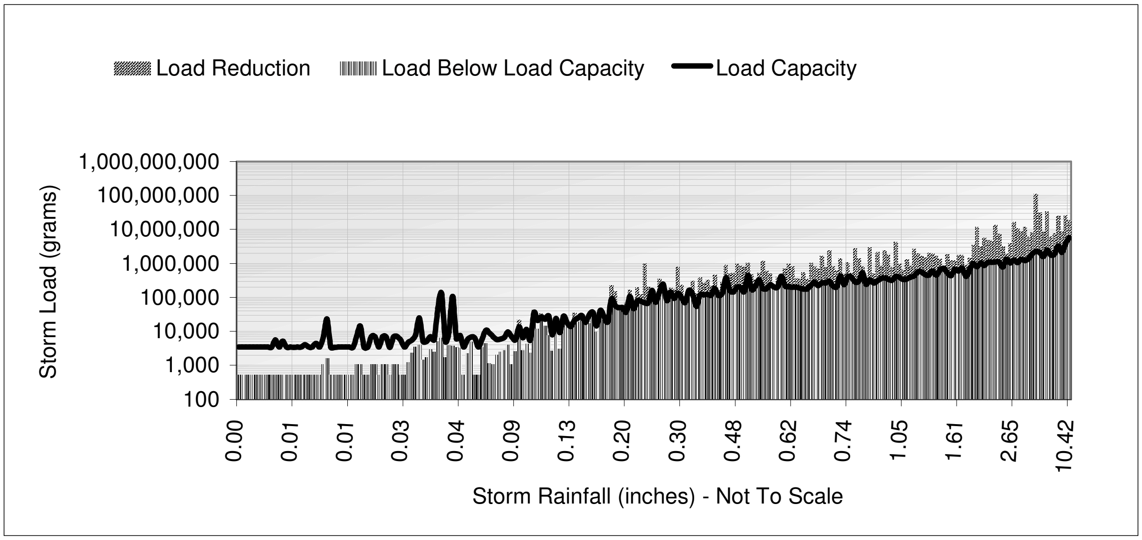
Computed Load Indicators:	Value	Units
Total Storms Over 10-Year Period:	193	none
Total Below Load Capacity Curve:	6,567	kg
Total Existing Load:	3,520	kg
Existing Load Below Load Capacity Curve:	2,600	kg
Existing Load Above Load Capacity Curve:	920	kg
TMDL Waste Load Reduction:	26.1%	none

Figure 7-12.6. Load-Duration Curve for Lead – Centinela Channel



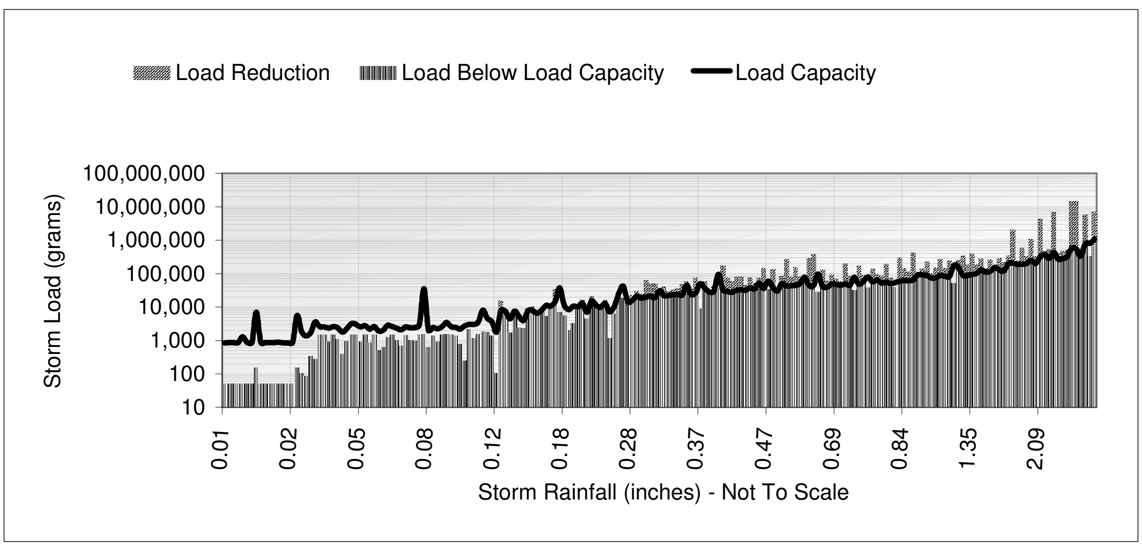
Computed Load Indicators:	Value	Units
Total Storms Over 10-Year Period:	200	none
Total Below Load Capacity Curve:	3,407	kg
Total Existing Load:	1,052	kg
Existing Load Below Load Capacity Curve:	880	kg
Existing Load Above Load Capacity Curve:	172	kg
TMDL Waste Load Reduction:	16.4%	none

Figure 7-12.7. Load-Duration Curve for <u>Zinc</u> –Ballona Creek at Sawtelle Boulevard



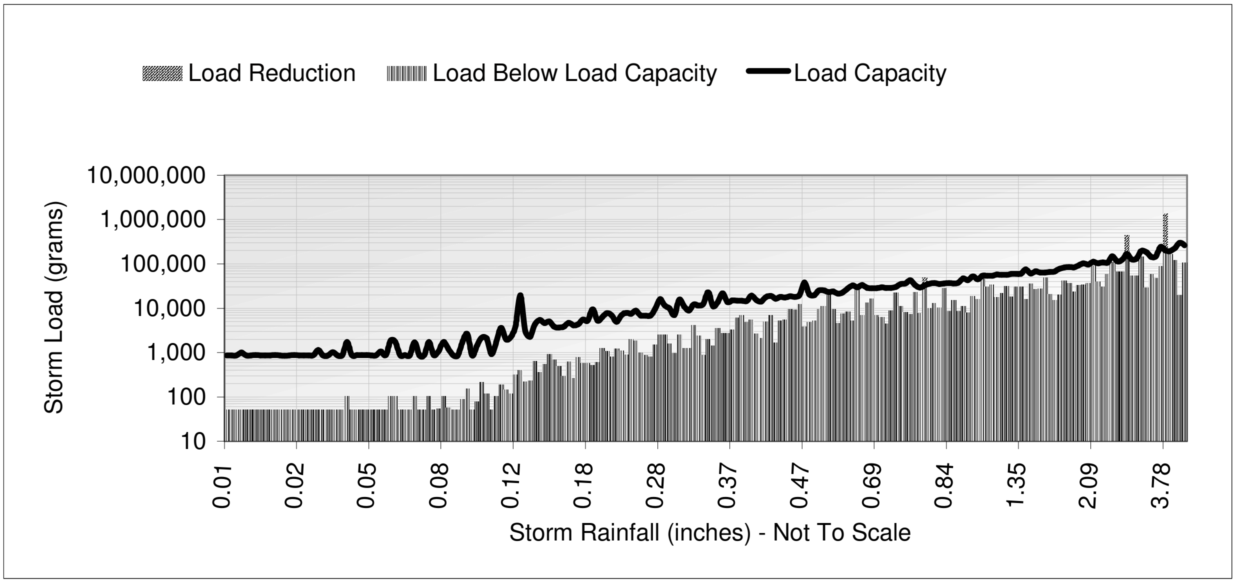
Computed Load Indicators:	Value	Units
Total Storms Over 10-Year Period:	226	none
Total Below Load Capacity Curve:	73,970	kg
Total Existing Load:	485,117	kg
Existing Load Below Load Capacity Curve:	73,037	kg
Existing Load Above Load Capacity Curve:	412,080	kg
TMDL Waste Load Reduction:	84.9%	none

Figure 7-12.8. Load-Duration Curve for <u>Zinc</u> – Sepulveda Canyon Channel



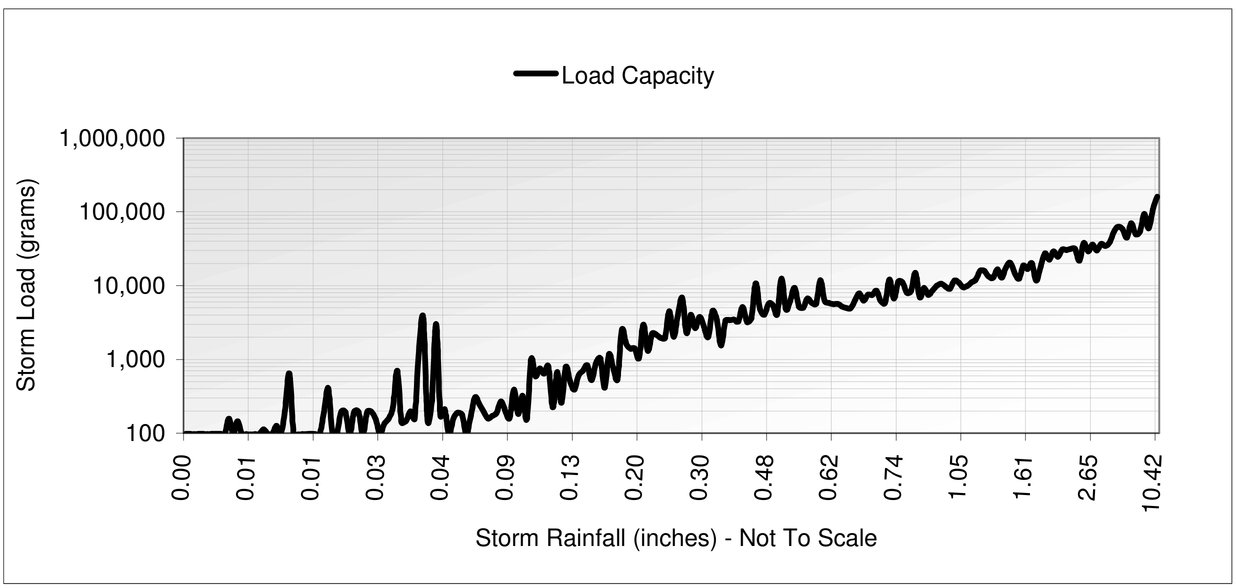
Computed Load Indicators:	Value	Units
Total Storms Over 10-Year Period:	193	none
Total Below Load Capacity Curve:	13,220	kg
Total Existing Load:	72,446	kg
Existing Load Below Load Capacity Curve:	12,069	kg
Existing Load Above Load Capacity Curve:	60,376	kg
TMDL Waste Load Reduction:	83.3%	none

Figure 7-12.9. Load-Duration Curve for Zinc – Centinela Channel



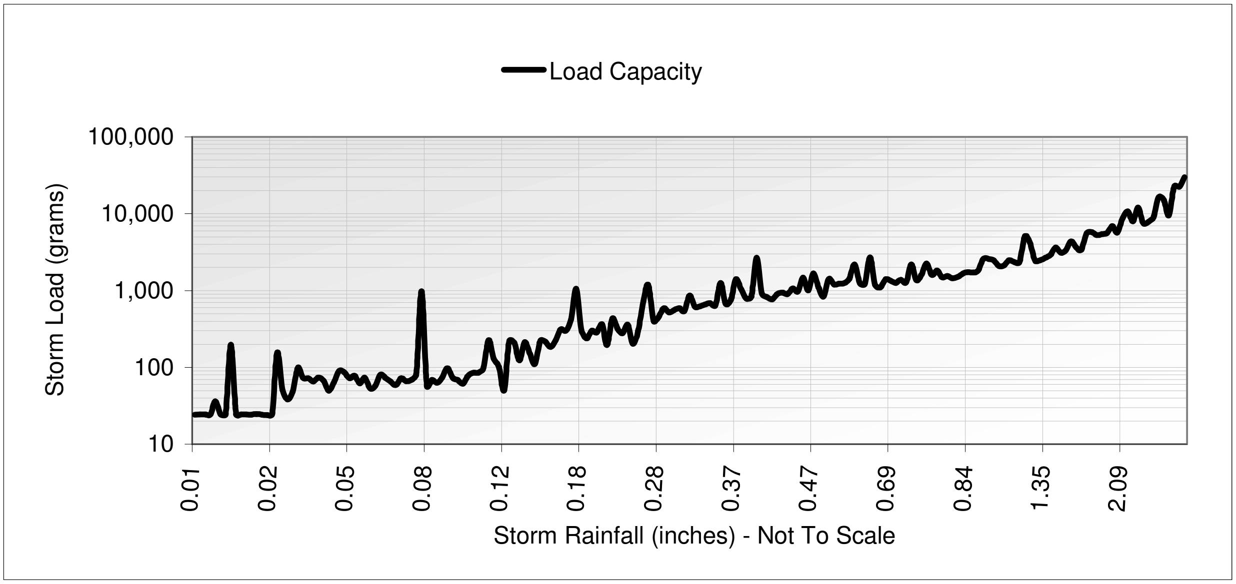
Computed Load Indicators:	Value	Units
Total Storms Over 10-Year Period:	200	none
Total Below Load Capacity Curve:	6,859	kg
Total Existing Load:	4,452	kg
Existing Load Below Load Capacity Curve:	2,994	kg
Existing Load Above Load Capacity Curve:	1,458	kg
TMDL Waste Load Reduction:	32.7%	none

Figure 7-12.10. Load-Capacity Curve for Cadmium – Ballona Creek at Sawtelle Boulevard



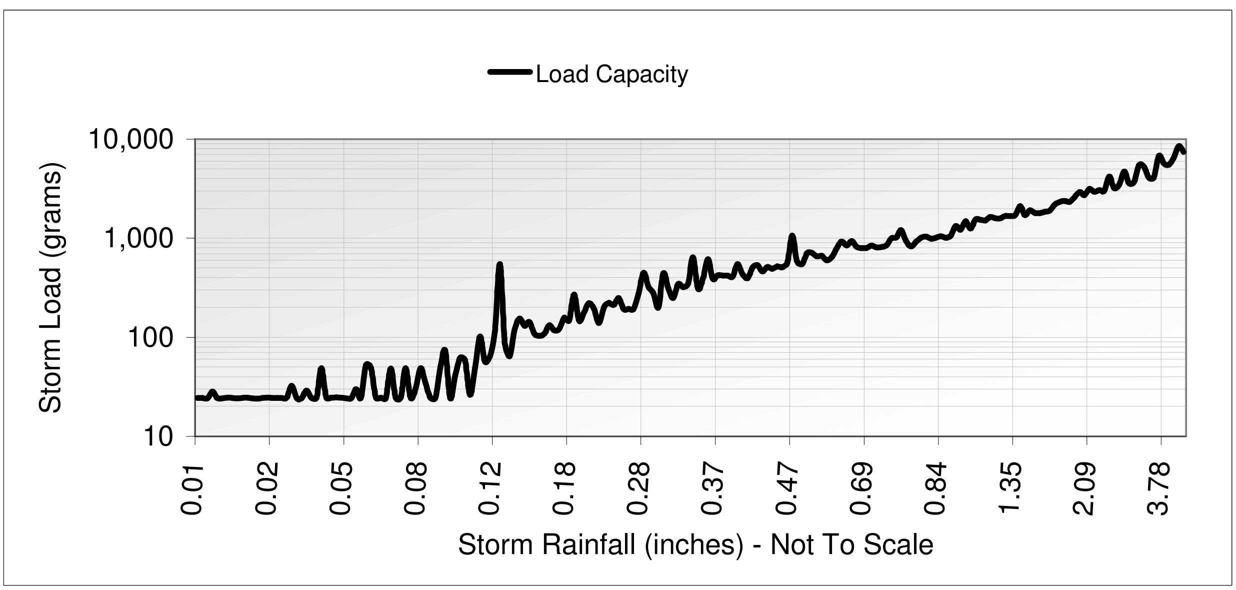
Computed Load Indicators:	Value	Units
Total Storms Over 10-Year Period:	226	none
Total Below Load Capacity Curve:	2,083	kg

Figure 7-12.11. Load-Capacity Curve for <u>Cadmium</u> – Sepulveda Canyon Channel



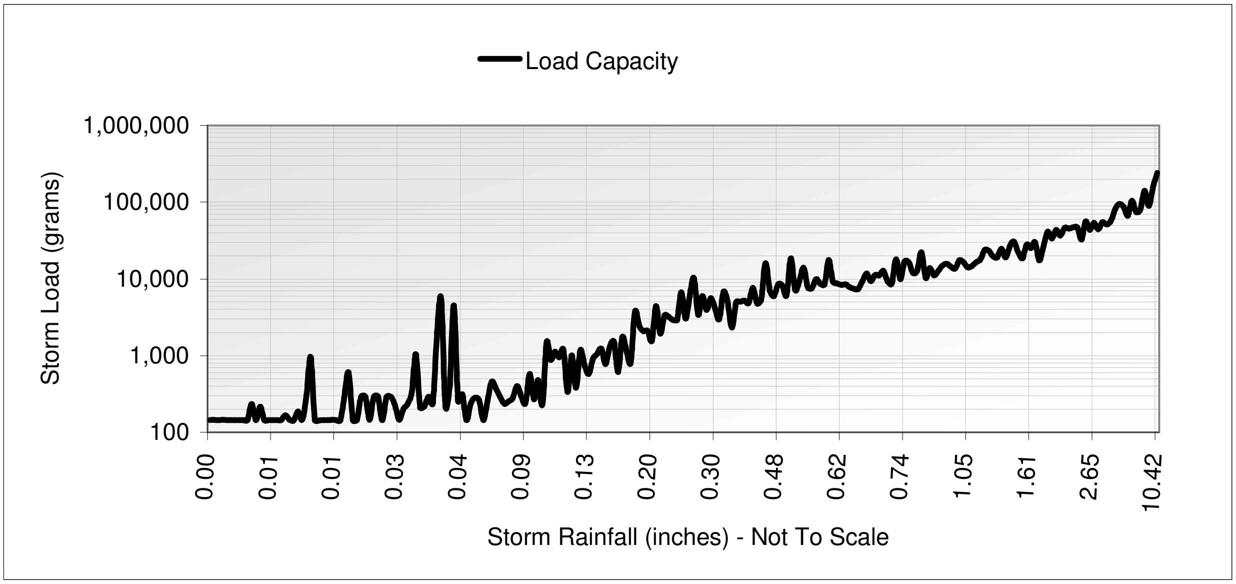
Computed Load Indicators:	Value	Units
Total Storms Over 10-Year Period:	193	none
Total Below Load Capacity Curve:	372	kg

Figure 7-12.12. Load-Capacity Curve for <u>Cadmium</u> – Centinela Channel



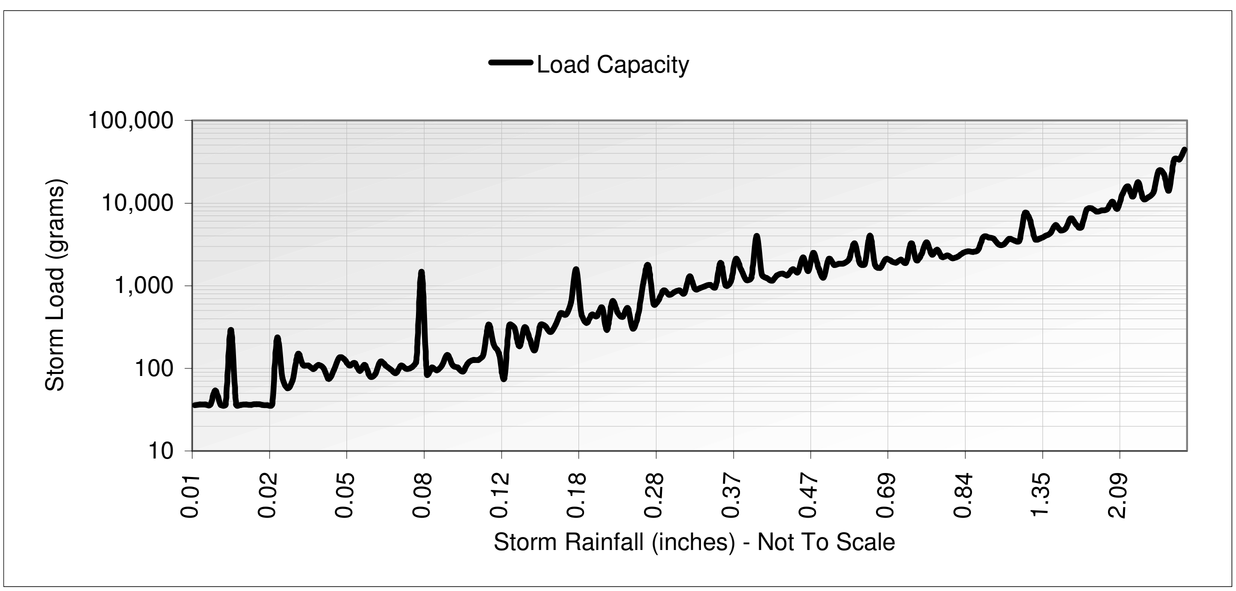
Computed Load Indicators:	Value	Units
Total Storms Over 10-Year Period:	200	none
Total Below Load Capacity Curve:	193	kg

Figure 7-12.13. Load-Capacity Curve for <u>Selenium</u> - Ballona Creek at Sawtelle Boulevard



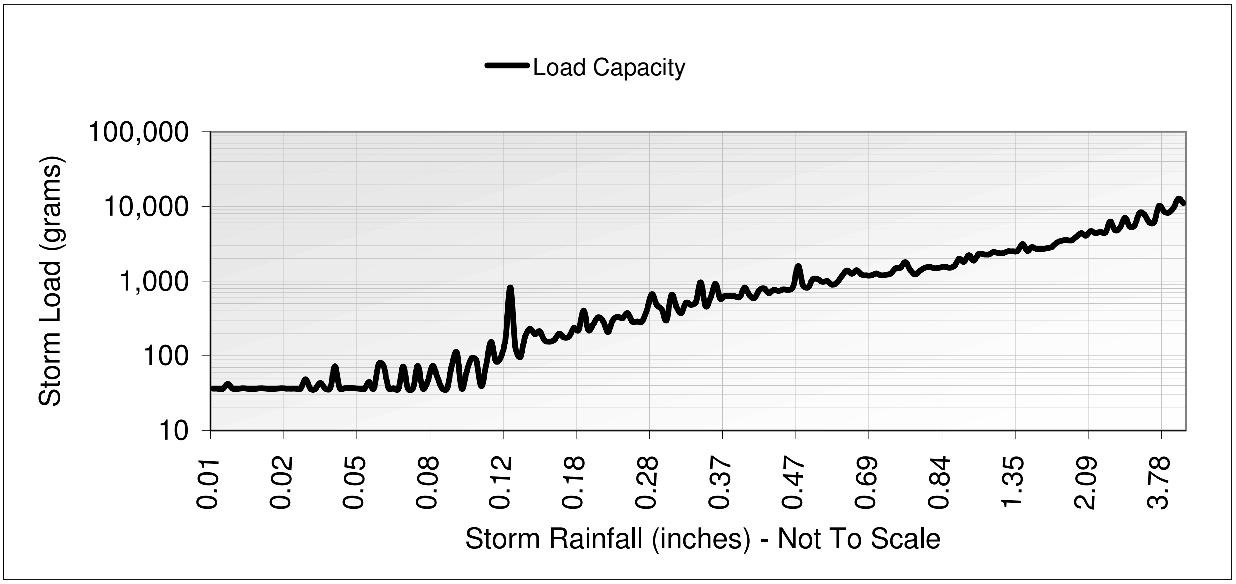
Computed Load Indicators:	Value	Units
Total Storms Over 10-Year Period:	226	none
Total Below Load Capacity Curve:	3,108	kg

Figure 7-12.14. Load-Capacity Curve for <u>Selenium</u> – Sepulveda Canyon Channel



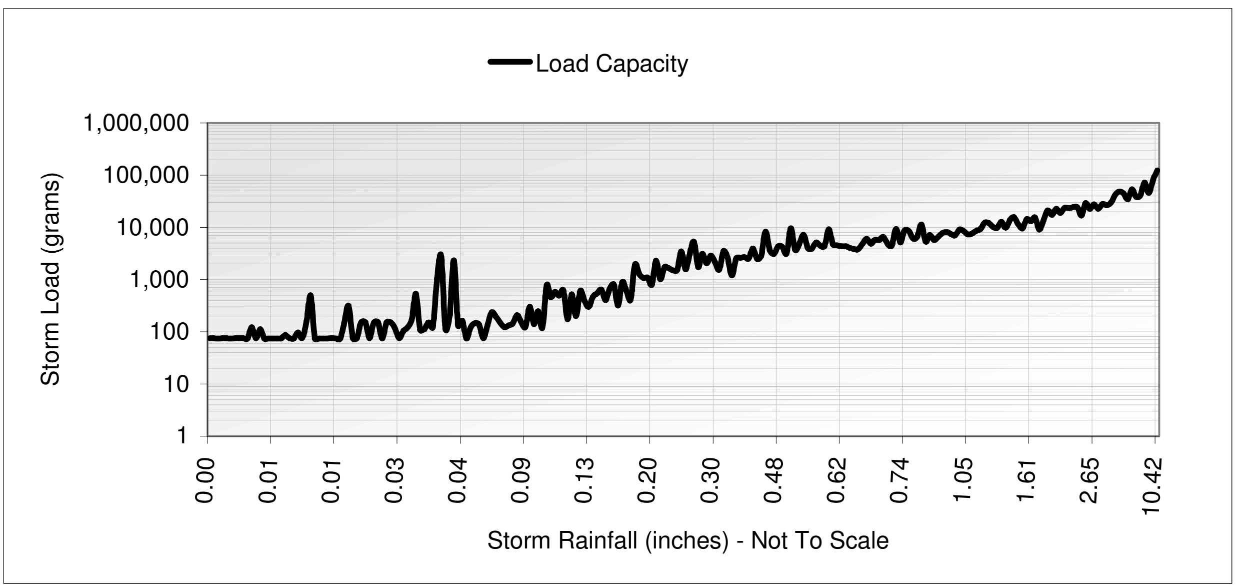
Computed Load Indicators:	Value	Units
Total Storms Over 10-Year Period:	193	none
Total Below Load Capacity Curve:	556	kg

Figure 7-12.15. Load-Capacity Curve for Selenium – Centinela Channel



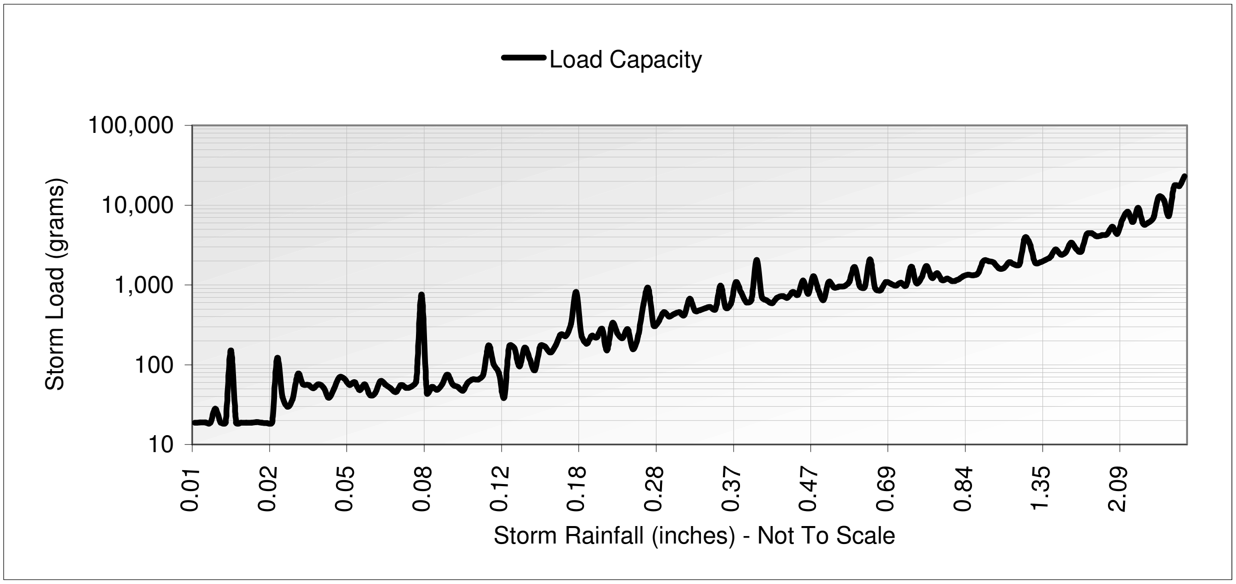
Computed Load Indicators:	Value	Units
Total Storms Over 10-Year Period:	200	none
Total Below Load Capacity Curve:	288	kg

Figure 7-12.16. Load-Capacity Curve for Silver - Ballona Creek at Sawtelle Boulevard



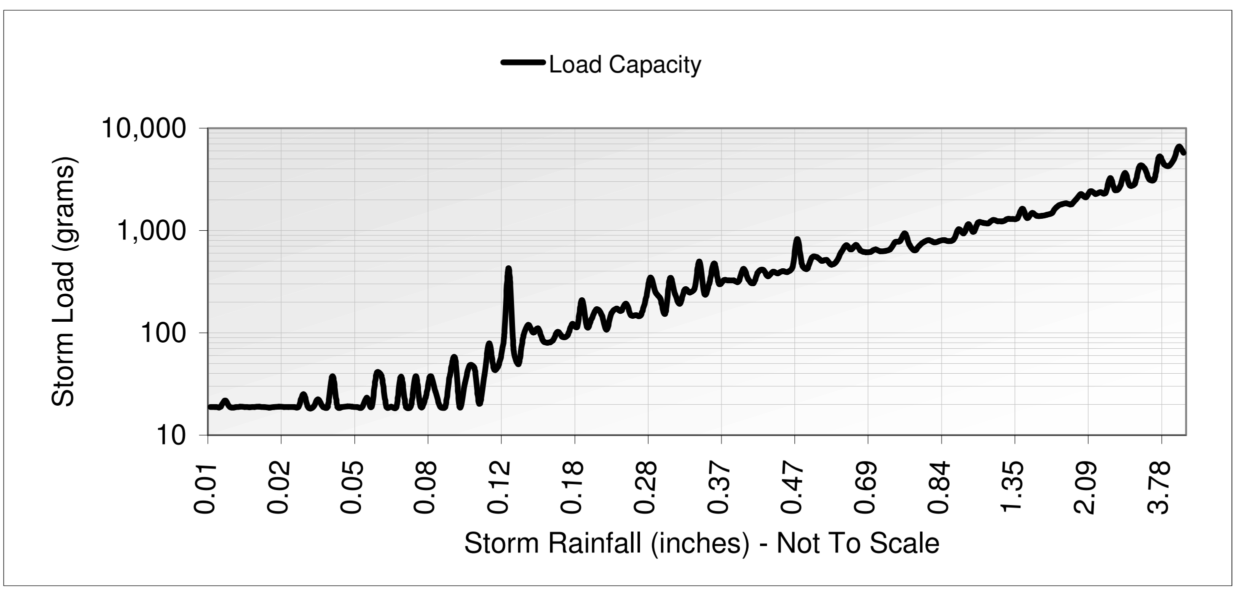
Computed Load Indicators:	Value	Units
Total Storms Over 10-Year Period:	226	none
Total Below Load Capacity Curve:	1,609	kg

Figure 7-12.17. Load-Capacity Curve for Silver – Sepulveda Canyon Channel



Computed Load Indicators:	Value	Units
Total Storms Over 10-Year Period:	193	none
Total Below Load Capacity Curve:	288	kg

Figure 7-12.18. Load-Capacity Curve for Silver – Centinela Channel



Computed Load Indicators:	Value	Units
Total Storms Over 10-Year Period:	200	none
Total Below Load Capacity Curve:	149	kg